**Investigating Chemical Reactions**

**Introduction:**

Chemical reactions are used in our everyday lives, some examples being when rust forms on a car, manufacturing paper, production of metals and baking a cake. During this lab you will carry out a variety of qualitative reactions. You will need to review the indicators of a chemical reaction and nomenclature along with the naming of chemical compounds. **Make observations before, during and after each reaction**. Some of the reactions will require you to test for gases. Recall that hydrogen “pops” with blazing splint and oxygen causes a glowing splint to re-ignite whereas carbon dioxide extinguishes a lit split with no sound.

**Purpose:**

To investigate, predict and classify chemical reactions into one of the four following categories synthesis, decomposition, single displacement and double displacement.

**Reaction 1:**

**Materials:**

|  |  |  |
| --- | --- | --- |
| * Safety goggles | * 5 mL of 1% Silver nitrate (AgNO3) | * Test tube rack |
| * Copper wire | * Test tube | * Pencil |
| * 10 mL graduated cylinder |  |  |

**SafetyPrecautions:**

* Silver nitrate is corrosive, toxic and hazardous **Avoid contact with skin as it will burn!**
* Copper nitrate is a strong oxidizing agent and is toxic if ingested.
* Do NOT pour products down the drain Use a waste disposal container.

**Procedure:**

1. Clean copper wire and make it into a coil using a pencil
2. Place copper wire into the test tube, and ensure it sits at the bottom
3. Slowly pour 5 mL of silver nitrate into the test tube placed in a test tube rack. **Never hold a test tube in your hands when performing an experiment.**
4. Gently swirl the test tube and wait 1-2 minutes.
5. Describe and record all observations.

**Reaction 2:**

**Materials:**

|  |  |  |
| --- | --- | --- |
| * mass balance | * test tube tongs | * safety goggles |
| * scoopula | * KMnO4   (potassium permanganate) | * splint |
| * test tube | * Bunsen burner & flint |  |

**SafetyPrecautions:**

* Avoid skin contact with potassium permanganate

**Procedure:**

1. Place approximately 0.5 grams of potassium permanganate into a clean, dry test tube**. Record all your observations.**
2. Light the Bunsen burner using the flint. Using a metal test tube clamp heat the tube in the Bunsen burner flame, **pointing the tube away from people.**
3. Light a splint then blow out the flame, creating a **glowing splint.**
4. After the colour of the Potassium permanganate has changed remove from heat, turn off Bunsen burner and insert a **glowing splint\*** into the mouth of the test tube.
5. **Describe and record the results in your data table**.
6. Once the test tube cools, rinse the contents down the drain and record the colors produced by the dilution of the product.

**Reaction 3:**

**Materials:**

|  |  |  |
| --- | --- | --- |
| * Magnesium ribbon * tongs | * Safety goggles * Bunsen Burner and flint | * tile |

**Safety Precautions:**

* Do NOT look directly at burning magnesium as it can cause eye damage.

**Procedure**:

1. Obtain a piece of Magnesium ribbon.
2. Holding one end with crucible tongs, ignite the other end in a Bunsen burner flame.
3. After ignition, hold the burning magnesium over a tile until the reaction is complete.
4. **Do not look directly at the burning magnesium!**
5. Describe and identify the product.

**Reaction 4:**

**Materials:**

|  |  |  |
| --- | --- | --- |
| * 0.1M Potassium iodide | * Test tube | * Safety goggles |
| * Lead (II) nitrate | * 10mL graduated cylinder |  |

**Safety Precautions:**

* Chemicals used are body tissue irritants. Wash hands with soap and water if exposed or at the end of the lab
* Lead (II) nitrate is moderately toxic and a possibly carcinogenic when ingested

**Procedure**:

1. Measure 5mL of potassium iodide using a graduated cylinder, pour into a test tube.
2. Add a few drops of lead (II) nitrate into the test tube.
3. Record all observations.
4. Dispose of waste in the **inorganic waste** bucket.